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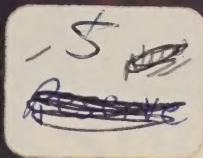


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United States  
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Agriculture

Animal and  
Plant Health  
Inspection  
Service

# African Swine Fever



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CURRENT SEATTLE RECORDS





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Cover: Pork products confiscated at the Santo Domingo International Airport are burned to destroy any ASF virus that might be present.

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# African Swine Fever: An Overview





## For ASF Eradication . . . Haiti's Next!

Haiti is the next target for African swine fever (ASF) eradication in the Western Hemisphere.

In December 1980, the Haitian Government requested assistance from international organizations and individual countries to combat this dread disease, introduced into that country some 2 years earlier. Canada, Mexico, and the United States have all expressed interest in cooperating in such an eradication effort.

The United States took a step forward towards cooperation when, in late January 1981, an "animal health emergency" was declared by the U.S. Department of Agriculture as a means of initiating measures for "countering spread of the highly contagious disease to the United States, its territories, and possessions." Puerto Rico is considered especially vulnerable to the disease because it is located approximately 75 miles from the Island of Hispaniola, which is shared by the Dominican Republic and Haiti. In turn, active tourism and trade between Puerto Rico and the United States would make it difficult to prevent spread to the mainland.

The emergency declaration authorizes "... a program in cooperation with the Government of Haiti, and with other governments and international organizations or associations, in carrying out operations or measures to eradicate, suppress, or

control African swine fever or vectors thereof from being introduced into and disseminated in the United States."

U.S. officials currently are involved in discussions on a joint ASF eradication effort in Haiti with animal health officials from Haiti, Canada, Mexico, and international organizations.

It is anticipated that the eradication effort in Haiti will be taken under the auspices of the Inter-American Institute for Cooperation in Agriculture (IICA), which is part of the Organization of American States. In past months, IICA has taken the lead in calling for eradication measures in Haiti. The Food and Agriculture Organization (FAO) of the United Nations also will participate in the effort, having had an involvement over the past 3 years in training and equipping Latin American countries to deal with this disease.

From the start, the presence of ASF infection in the Western Hemisphere has concerned both ASF-free and ASF-infected countries. With infection limited to a few countries—and the obvious economic dangers of letting it run rampant—many experts hoped to eradicate it from the hemisphere rather than allowing it to remain a continuous nearby threat.

Cuba eradicated an outbreak of African swine fever in early 1980. Brazil recently initiated a serological survey in its principal pig production areas to kick off a program for ASF control and eventual eradication.

The eradication effort in the Dominican Republic, begun in 1979, appears to be highly successful and the effort to revitalize the swine industry in that country is making good progress. As ASF is successfully eradicated from individual countries, the entire Western Hemisphere's freedom from this virus may be within sight.

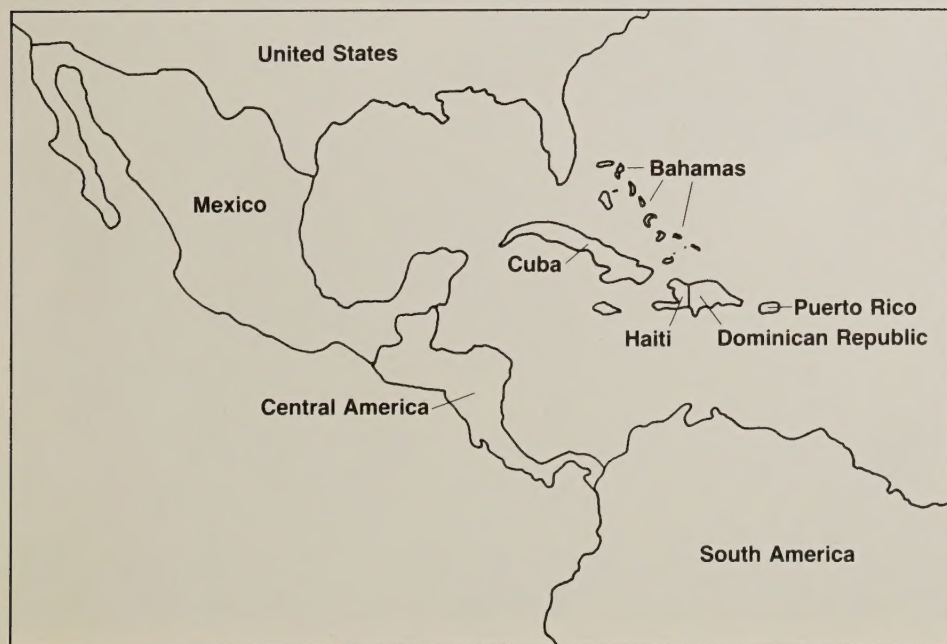
Individual countries, with the assistance of international agencies, have already invested a large amount of time and money in eradication efforts. Veterinarians from the Canadian Ministry of Agriculture and the United States Department of Agriculture went to Brazil as advisors at the request of the Brazilian Government following the ASF outbreak in that country. FAO, the Inter-American Development Bank (IDB) and the U.S. Agency for International Development (AID) have spent approximately \$10 million on ASF eradication and prevention activities in the Western Hemisphere.

The U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), the Spanish Ministry of Agriculture and the Australian Department of Primary Industry, under the auspices of FAO, have sent consultants throughout Latin America to give technical assistance to various countries. The purpose was to help establish field and laboratory diagnostic capability within those countries to diagnose the disease quickly if it should appear.

In 1978, shortly after the disease was diagnosed in Brazil and the Dominican Republic, two organizations of the United Nations—FAO and the Pan American Health Organization (PAHO) of the World Health Organization (WHO)—joined in holding an emergency consultation in Lima, Peru on the prevention and control of ASF in Latin America. Attendance by animal health officials from most countries of the Western Hemisphere pointed up the importance of this meeting.

This was followed up by an ASF diagnostic course held by USDA's Plum Island Animal Disease Center (PIADC) in New York for laboratory personnel from Western Hemisphere countries. PIADC offered subsequent courses to others.

Another major technical consultation was convened in Panama City in 1979 by FAO, in collaboration with the Ministry for Agricultural Development of Panama.



The Dominican Republic and Haiti share the island of Hispaniola.



Almost from the first days of the ASF outbreak in the Dominican Republic, international technical cooperation was apparent, with organizations as well as concerned countries helping the Dominican Republic find a way to deal with ASF. The Dominican Government called upon international experts as well as their own diagnosticians for advice. Cuba, Spain, and the United States sent animal health specialists to work with Dominican authorities in assessing the extent of the outbreak and drawing up control strategies.

In 1978 and 1979 FAO and IDB sponsored a series of four training courses on field diagnosis and control in the Dominican Republic. Specialists from APHIS's Veterinary Services lectured in these courses. Dominican officials have also encouraged animal health specialists from other countries to observe the eradication program and learn from the Dominican experience.

In mid-1980, AID, FAO, and APHIS began a cooperative information effort to document the situation in the Dominican Republic, part of the same international effort to help ASF-free countries of the Western Hemisphere avoid introduction of this costly disease. 🐷

## Foreign Animal Diseases . . . Keep 'Em Out!

The most efficient way to deal with an exotic animal disease is to prevent its entry.

So says Dr. Harry C. Mussman, administrator of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS).

According to Dr. Mussman, the cornerstones of an effective national animal health defense system are an effective port-of-entry and quarantine system; a mobile, trained field veterinary force; capable laboratory support; and a well-prepared government animal disease eradication organization.

Dr. Mussman notes that recent outbreaks of African swine fever (ASF), a costly and devastating foreign disease for which no protective vaccine nor treatment exists, point up that countries need to think ahead to avoid facing widespread infection.

ASF often spreads from nation to nation via uncooked virus-laden pork scraps that are fed to swine. In Latin American countries, the widespread practice of using garbage as swine feed makes the international spread of this disease very likely.

"A major part of the prevention task, therefore, lies with national inspection and quarantine officials," Dr. Mussman stresses. "They are responsible for controlling the disposal of airport and seaport food-scrap, checking international cargoes and passenger luggage, and maintaining a careful watch on the importation of live animals and meat products to assure that no ASF virus enters their country."

But no country's inspection and quarantine service can be expected to be 100 percent effective.

"So if ASF crosses the border, a second vital line of defense must be the capability for early diagnosis before the disease can spread to major portions of the swine industry," Dr. Mussman says.

He emphasizes that rapid identification of the disease is possible only with the support of an informed farming public, an alert field veterinary force, and a laboratory with differential diagnostic capability.

"The swine producer must know the symptoms he should watch for in his herd," Dr. Mussman says.

"The field veterinarian then holds



Feeding raw garbage to hogs is the principal way the ASF virus enters a swine population.



the key to early identification, for he is most likely the one who will sound the first alarm. And because ASF in the field resembles other, more common swine diseases, differential diagnosis in the laboratory must be readily available.

"Finally, if a positive diagnosis is made, the country must be ready to act before the disease has a chance to spread further."

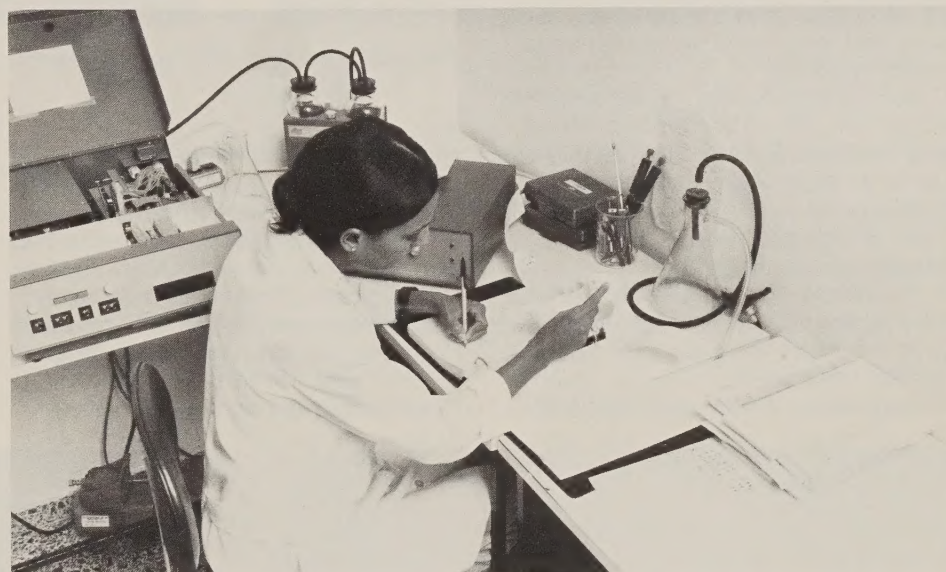
Dr. Mussman notes that an emergency group must be ready to deal with the problem quickly. And that group must have the legislative backing and power to take whatever steps are necessary to contain the outbreak.

Action may come in the form of quarantining individual premises or entire regions. The emergency group most likely will call for destruction of infected and exposed herds. If a system of compensation does not already exist to pay farmers for pigs that are destroyed, there is little chance of obtaining the vital industry support needed for an effective eradication effort.

"The spread of an exotic animal disease that can devastate a country's livestock industry, and thus the people's protein supply, can be avoided," Dr. Mussman emphasizes. "It is a matter of prevention and preparedness . . . on the part of the whole country." 🐷



Trained field veterinarians are essential to an effective animal health defense system, for they will most likely sound the first alarm.



Trained workers at well-equipped laboratories must be capable of early diagnosis of foreign animal diseases.



A country's first line of defense against foreign animal diseases is an effective national inspection and quarantine service.



# The Disease Called African Swine Fever

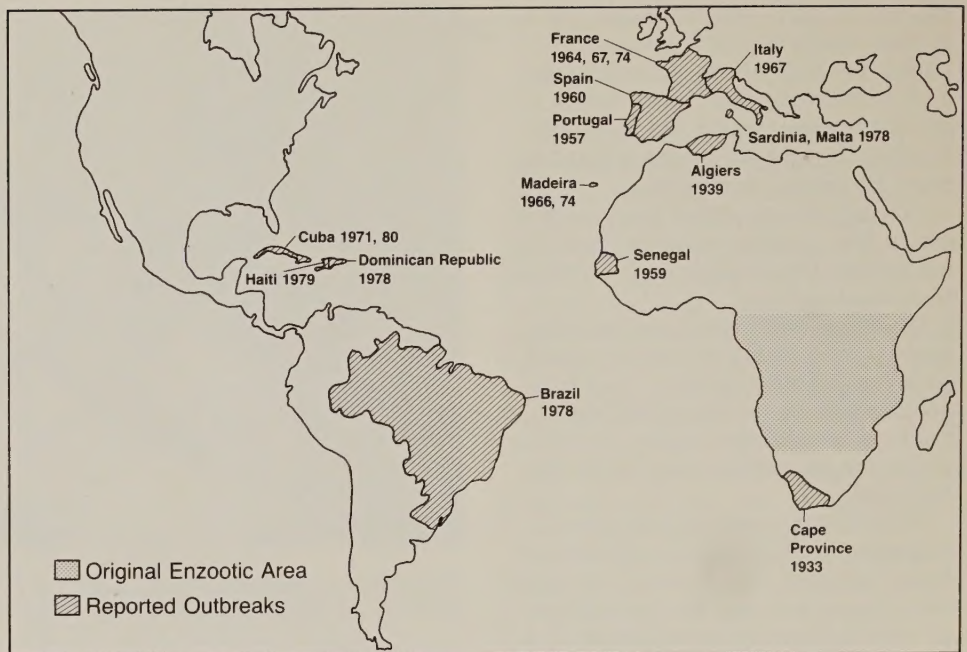
## A Brief History

African swine fever (ASF) was first recognized in Kenya, East Africa, in 1909, when settlers from Europe who brought hogs with them experienced severe losses in their swine herds. From 1909 until 1912, 15 outbreaks of ASF were reported in Kenya, with mortality approaching 100 percent.

From 1931 to 1961, approximately 60 outbreaks were reported in Kenya. Infection continues to occur there and in various parts of sub-Saharan Africa. In Africa, an inapparent form of ASF occurs in the wart hog, bush pig and other wild swine. These animals serve as carriers and transmit ASF to domestic herds in Africa.

ASF is also spread by the *Ornithodoros* tick, which is found in Africa and southern Europe and feeds on swine at night. ASF virus can be perpetuated indefinitely in these ticks. Although this particular species of tick is not known to exist in the Western Hemisphere, there is always the possibility that the ASF virus might become adapted to a similar species.

Outbreaks of ASF outside south-



ASF outbreaks have occurred worldwide.

central Africa have been reported from South Africa, Algeria, Senegal and Sao Tome and Principe; but the entire continent is considered to be infected.

The global threat of the disease became apparent when ASF invaded Portugal in 1957. It spread to Spain in 1960, and to France in 1964. France reported further outbreaks in

1967 and 1974, but successfully eradicated the disease through quarantine and slaughter.

Outbreaks occurred on mainland Italy in 1967 and on the island of Sardinia in 1978. Malta also experienced an outbreak in 1978. The disease was reported on the island of Madeira in 1966 and again in 1974.



White-skinned hogs with ASF may show red, blotchy discolorations.





In Africa, an inapparent form of ASF occurs in the wart hog, bush pig and other wild swine.



African swine fever now often appears in a chronic or sub-clinical form. "Carrier" pigs that survive present a great danger of spreading the disease before it is diagnosed.

In 1971, ASF invaded the Western Hemisphere for the first time when it struck Cuba. The entire swine population of the province of Havana—about 460,000 hogs or one-third of that country's swine—was slaughtered to eliminate the infection.

In late 1977, Portugal experienced a dramatic increase in disease incidence. This was followed, in March 1978, by the reports of outbreaks on Sardinia and Malta.

In June 1978, ASF was found for the second time in the Western Hemisphere when Brazil reported extensive outbreaks. There is some evidence that the disease had been present there for some time, but had been confused with hog cholera.

In July 1978, ASF was confirmed in the Dominican Republic, which has since carried out an eradication campaign against the disease. In January 1979, it was reported that tissue samples from Haitian swine were positive for ASF. Haiti has requested assistance for an eradication program.

Finally, in early 1980, ASF was confirmed in eastern Cuba. Cuba mounted an active eradication program against ASF and slaughtered infected and exposed herds as well as all other swine in the area. It appears that eradication has been successfully achieved.

## Disease Signs

The first sign of ASF is reduced appetite, but more often dead pigs

are the first indication seen by producers.

The incubation period varies widely, up to 14 days or longer. A pig infected with ASF first undergoes an abrupt rise in temperature, from a normal 101°F. (38.3°C.) to 105°F. (40.6°C.) or higher. The animal may seem to "burn up" with fever.

Pregnant sows often abort at any stage of pregnancy, generally within a day or two after the initial temperature "spike."

Infected pigs have a tendency to lie down and act depressed. They may cough or have labored breathing.

White-skinned hogs may show a discoloration—a blotchy or diffuse redness—on their ears, snout, tail, legs, abdomen and flanks.

Pigs with ASF often continue to eat and drink limited amounts of food and water until near death. This frequently causes the owner to think they are improving, and thus not file a report of illness.

## The Changing Form of ASF

Long considered a 90- to 100-percent killer of infected herds, African swine fever now is appearing throughout the world in a chronic or subclinical form. This milder appearing disease has a much lower mortality rate—somewhere between 20 and 50 percent.

Carrier pigs are a major problem with this form of ASF. Seemingly

recovered pigs can continue to carry the virus for prolonged periods—most likely for as long as they live. If slaughtered for food, there is the chance that virus-laden meat scraps may be fed to other swine and thus perpetuate the disease.

Often, when the disease is transmitted by contact between a carrier animal and a healthy herd or via infected meat scraps fed in garbage, the virus may "heat up" and the cycle of large outbreaks and higher losses recurs.

The difference in mortality and duration of illness in this new form has altered the clinical and post-mortem picture of ASF. Clinical signs and post-mortem lesions of chronic and subacute ASF infection are not consistent from one case to the next. Although some classical signs may be present, absence of a high temperature or certain extreme lesions does not rule out the possibility of ASF infection.

Field diagnosis is often difficult because the less virulent form of ASF closely resembles and may be easily confused with a number of other swine diseases, including hog cholera, salmonellosis and erysipelas. Thus, confirmation in the laboratory is essential.

## Virus Resistance

African swine fever is caused by a relatively large DNA virus that is exceptionally resistant to environmen-



tal inactivation factors as well as to many disinfectants. The virus can survive and remain viable in soil, blood, bone marrow and pork at room temperature for several months.

ASF virus is inactivated in 20 minutes at 60°C. (140°F.), but heating at 56°C. (132°F.) for 30 minutes—the conventional method for inactivating sera prior to testing—does not completely inactivate the virus.

In recovered swine, high antibody titers occur; but they do not neutralize the virus and most recovered pigs are virus carriers. This inability of antibodies to neutralize the virus dims hope for an effective vaccine.

There is no effective treatment for the disease. 🐷

## ASF Costs—A Lot!

The bottom line of any hog-raising operation is making money—in any country of the world.

Most producers leave some leeway in their budgets to handle the costs related to animal disease—drugs, visits by a veterinarian, lost production time. But no budget is big enough to handle a disaster like African swine fever. African swine fever (ASF) can put a producer out of business overnight. And it can cost a nation's swine industry millions of dollars.

The recent outbreak of African swine fever in the Dominican Republic is a good example of what can happen to producers—and a swine industry—when ASF strikes.

The swine population of the Dominican Republic was estimated at approximately 1.4 million when African swine fever was confirmed on July 8, 1978. The Dominican government decided to eradicate the disease rather than “live with” the long-range production costs and marketing disruptions that ASF causes. Pork plays an important role in the Dominican diet. So even though eradication efforts seriously disrupted swine production over the short run, over the long run, losses in production from living with ASF would have meant lesser quantities of vital protein in the diets of many Dominicans.

Because African swine fever had spread throughout the Dominican Republic, the government decided that the only way to eradicate the disease would be to get rid of all swine in the country and start over

again. By October 1979, the swine population had been cut in half through deaths, destruction of infected and exposed pigs and voluntary sacrifices for consumption. A structure was set up to systematically eliminate the remaining hogs and then repopulate the country with new, healthy swine. By the fall of 1980, all pigs were destroyed; and cleaning and disinfection, “fallow” time and sentinel swine operations were all well underway.

Obviously this has had a severe impact on the country's economy. The facts and figures of the Dominican outbreak tell the story. And these could have been worse. Because many pigs were sold for slaughter before “depopulation” efforts began—and because the program was completed ahead of schedule—costs were just over half of the original estimate of \$27 million.

Nevertheless, these figures do not take into account the many costs to the Dominican Government of personnel and services diverted to fight ASF. Nor do they consider losses for which Dominican swine producers are not indemnified. Also not calculated are indirect losses in terms of allied industries, unemployment and the like. Finally, the Dominican Republic had signed a contract to export pork shortly before ASF was confirmed. Discovery of the disease negated this trade deal, and a \$2 million export market went down the drain before the first shipment could be made.

Other countries where ASF has occurred have had similar experiences. According to a report by the

Food and Agriculture Organization (FAO) of the United Nations, a 1978 outbreak in Malta caused the death or slaughter of 80,000 hogs—the island's entire swine population. That outbreak cost an estimated \$45.2 million—\$6.2 million for the eradication program, \$14 million to restock the pig population and \$25 million for unemployment and other indirect losses.

In a 1971 outbreak in Cuba, the entire swine population of the Province of Havana—nearly a half-million hogs—had to be eliminated. Another outbreak in early 1980 in eastern Cuba caused the destruction of some 166,000 hogs—60 percent of which were destroyed and the remainder salvaged through slaughter and deboning and cooking the meat.

Portugal and Spain, in spite of control campaigns, have shown significant animal losses over the past 20 years, according to FAO reports. Between 1967 and 1976, Spain spent more than \$143 million on ASF control programs. If losses from embargoes on swine and pork exports and other factors are considered, total losses greatly exceeded that figure.

Although the United States has never experienced an outbreak of ASF, a recent study by the University of Minnesota examined what might happen if the disease invaded this country. The study looked at three scenarios: (1) A small outbreak that could be wiped out quickly; (2) widespread outbreaks over an entire state that could take three years to eradicate; and (3) a situation where the United States has to “live

### African Swine Fever

## Funding According to Number of Years Required to Eradicate Disease (\$ millions)





with" endemic ASF over a period of years before eradication is attained.

Costs of eradicating a "small" outbreak were estimated at \$7.3 million. Total direct costs of eradicating a larger outbreak over a 3-year period were put at nearly \$152 million. Finally, long-term control and eradication programs were estimated to cost some \$290 million over a 5-year period and nearly \$560 million over a 10-year span. These latter costs do not take into account some \$2.3 billion in increased prices that consumers would have to pay for pork and substitute products.

On the export side, if ASF became established in the United States, there would be an annual loss of some \$300 million in pork and related products, plus a partial or complete embargo of other U.S. agricultural exports, including grain, soybeans and cotton, which now total \$25 billion annually.

All these aggregate figures do not, however, measure the impact on the individual hog producer. When a disease such as African swine fever enters a country, all producers—large and small—are affected. Although large commercial producers can usually take protective measures for the long term, small producers often find they are unable to defend themselves against the ravages of the disease. Repeated losses among their small number of animals rapidly reduce the desirability of maintaining them. In Latin American countries where the backyard pig is an integral part of society, discontinuing swine production removes what may be a producer's only ready source of cash.

So any way you look at it, African swine fever costs—a lot! 🐷

## Laboratory Training Is Critical

Setting up laboratories capable of screening and testing for African swine fever (ASF) is especially critical at this time, according to Dr. Gary Colgrove, a veterinary medical officer with the U.S. Department of Agriculture's Plum Island Animal Disease Center (PIADC).

But Dr. Colgrove, who is a consultant at the ASF diagnostic labora-

tory in the Dominican Republic, points out that this is not an easy task. It requires a specially trained laboratory staff as well as a fully equipped laboratory.

"It's important to keep exotic animal diseases out of a country," he notes. "At the same time, if a foreign disease has slipped by a country's border defenses, that na-



Setting up a laboratory is time-consuming and expensive—but it can be worth its weight in gold if a foreign animal disease strikes.



tion must be ready to deal with the problem immediately.

"And that's where the laboratory comes in," says Dr. Colgrove. "An alert field veterinarian, aided by an informed swine producer, may tentatively diagnose the first case of ASF. But he must have a laboratory capable of differential diagnosis to turn to for quick and accurate confirmation."

According to Dr. Colgrove, training of Western Hemisphere laboratory personnel is available at USDA's PIADC, located off Long Island, N.Y. Laboratory consultants from PIADC also conduct onsite followup instruction of foreign laboratory personnel. And reagents needed for three of the six laboratory tests for ASF are available from Plum Island.

Three of these tests are used to detect the virus itself, according to Dr. Colgrove. These are hemadsorption, direct immunofluorescence (or direct fluorescent antibody) and animal inoculation. The other three, which detect antibodies, are indirect immunofluorescence, immunoelectrophoresis (IEOP) and enzyme immunoassay (ELISA).

"The ELISA test currently is being used to screen for ASF antibodies," Dr. Colgrove said.

The virus detection tests, which are run with tissue samples, are the most dependable, in diagnosing acute ASF. Antibody detection tests, requiring serum samples are most valuable in dealing with chronic forms of the disease.

According to Dr. Colgrove, the key to quick and accurate diagnosis lies in a good batch of tissue and blood serum samples from the field.

"But even with good samples, no single test is sufficient," he emphasizes. "For instance, accurate diagnosis for the acute and chronic phases of ASF requires different tests. In addition, it's now felt that different strains of the virus may exist, which are not detected by every test.

"Finally," he notes, "because of the nature of the currently available tests, there may be false positives or negatives."

To accurately handle ASF surveillance and detection, Dr. Colgrove says that a laboratory should be able to successfully perform hemadsorption, direct immunofluorescence, indirect immunofluorescence and pig inoculation. In the case of an actual outbreak of African swine fever, the final two tests—IEOP and ELISA—may be necessary to rapidly

screen samples for ASF antibodies.

Dr. Harless A. McDaniel, chief of technical support for USDA's emergency programs within the Animal and Plant Health Inspection Service, points to another area that needs attention. "This is the need to establish standby capabilities—equipment, reagents and trained personnel—to quickly set up an emergency laboratory for specific livestock and poultry diseases.

"Establishing laboratories to support emergency eradication programs requires more time than any other aspect of a task force," Dr. McDaniel emphasizes.

"Setting up a laboratory is a time-consuming and expensive venture," Dr. Colgrove adds. "But if it can help a country avoid the much greater expense of a country-wide ASF outbreak, it's worth its weight in gold." 🐷

## Responding to an Emergency . . . Get Ready, Get Set, Go!

When African swine fever struck the Dominican Republic, no system for emergency animal disease eradication existed in that country. The government was faced with the problem of devising such a system, obtaining legislative authority and funding, and then setting up procedures and staff to operate the program.

Thus, it took nearly a year before

systematic eradication efforts could begin. Had a preestablished organization for handling emergency outbreaks existed, the Dominican Republic might have been able to eradicate the disease at a lower cost and in a shorter time—by quarantining and slaughtering pigs in a few focal areas of infection before the disease had a chance to spread across the country.



Dr. Jerry Mason, chief of field operations, briefs officials in Hyattsville, Md., on the status of a simulated foreign animal disease outbreak in a recent test exercise carried out by APHIS' Regional Emergency Animal Disease Eradication Organization (READEO).



Dr. John K. Atwell, deputy administrator for Veterinary Services in the U.S. Department of Agriculture's Animal and Plant Health Inspection Service, points out that because entry of a foreign animal disease is so likely in this age of mass transit, countries are beginning to see the benefits of setting up an emergency group as a precaution against a wide range of exotic animal diseases.

"By doing this well in advance, a nation can be prepared to fight a foreign animal disease when it first strikes," Dr. Atwell says. "Sources of funding are already identified for compensation, transportation, cleaning and disinfection and other direct costs of eradication, so that precious time is not lost searching for money when an outbreak occurs.

"Specialists can be identified in various fields—poultry, swine and cattle diseases, epidemiology, laboratory diagnosis, vector control, wildlife, cleaning and disinfection, disposal, public information. They can be trained in emergency proce-

dures," he continues. "This core group can be immediately taken off their regular jobs in order to quickly contain an outbreak while additional personnel are being identified."

Dr. Atwell notes that the United States is one nation that currently has an emergency foreign animal disease eradication organization.

"Outbreaks of Venezuelan equine encephalitis (VEE), exotic Newcastle disease and hog cholera in the United States pointed up the need for an emergency response team," he says.

"We maintain a small nucleus of specialists on our emergency programs staff. During an emergency, other personnel are assigned to special task forces.

"The emergency response system is tested annually to train new personnel and identify any problems," he notes.

Because of the immediate threat posed by African swine fever, APHIS's 1980 test exercise was designed around a simulated outbreak of ASF in Puerto Rico.

"Our emergency group and its ability to deal quickly with disease outbreaks has allowed the United States to rapidly contain and eliminate 19 foreign animal disease outbreaks during the past decade—to help maintain a healthy and thriving livestock industry," Dr. Atwell says. 🐷

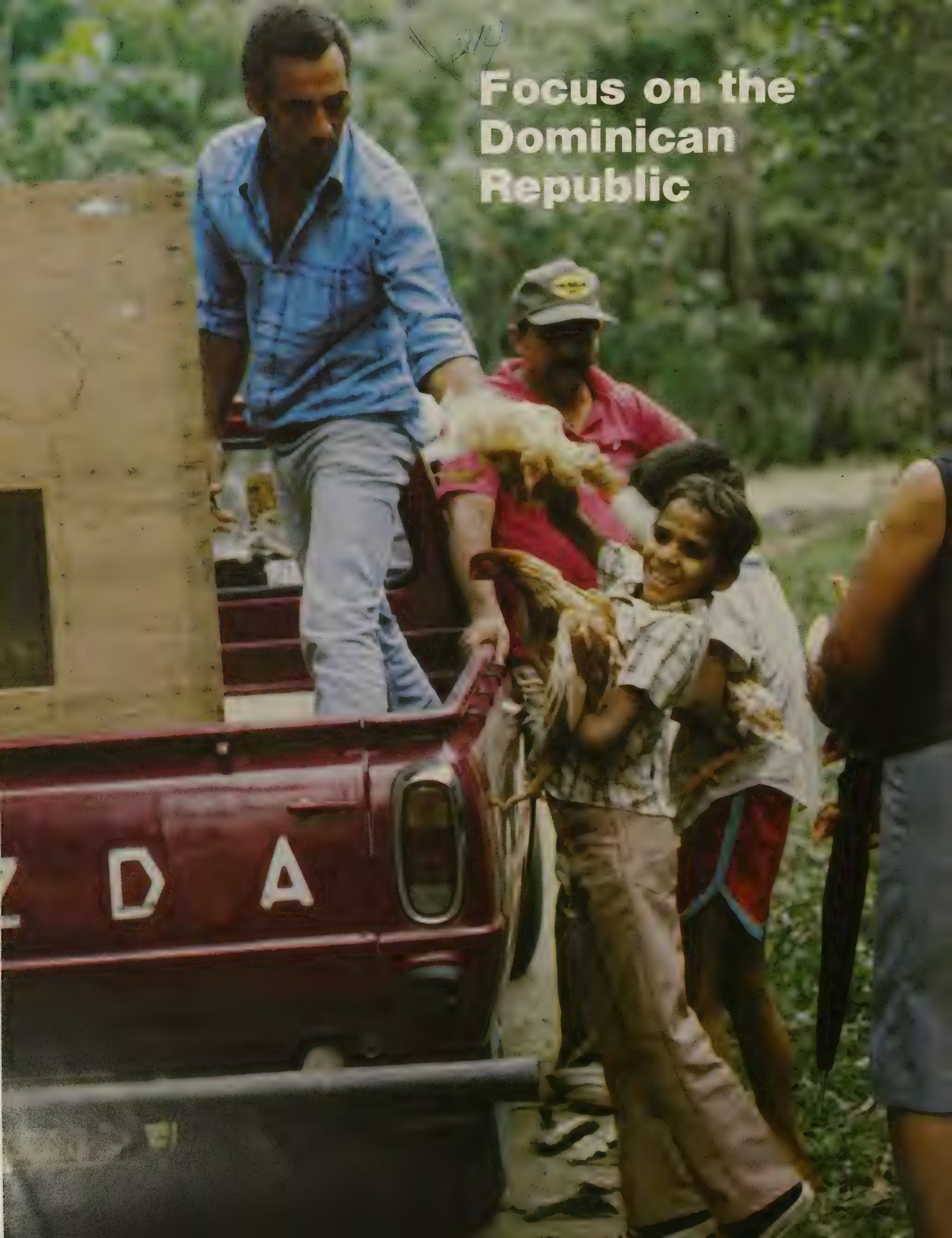


A READEO task force was activated in Puerto Rico during a May 1980 test exercise dealing with ASF. Periodic tests are run in both the office and the field. Dr. Joe Hendricks, APHIS epidemiologist, helped test radio communications capability by calling in reports to task force headquarters while visiting swine operations throughout the island.



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# Focus on the Dominican Republic





## Caribbean Nation Kills Its Swine . . . Dominicans Live Without Hogs —Temporarily

They've killed every single hog in the Dominican Republic.

This small Caribbean country of 5.1 million people has become the major battleground in the fight against African swine fever (ASF) in the Western Hemisphere. To free itself of this costly swine disease, the Dominican Republic has now eliminated its entire swine population as a prelude to restocking with healthy pigs.

Pigs have always played a critical role in the lives of the Dominicans. Besides regular commercial production for domestic use and exports, nearly all rural families keep a few animals—for daily use, the traditional Christmas roast pig or for quick cash. These hogs are usually kept in rural families' backyards or run loose in neighborhoods—converting practically any food available into protein.

However, in the spring of 1978, pigs began dying mysteriously. And as is common when ASF enters a new location, the disease was mistaken for hog cholera. An intensive vaccination program followed, but it soon became evident that vacci-

nated pigs were dying as quickly as nonvaccinated pigs. Veterinarians diagnosed ASF in July 1978.

But by then the disease had spread across the country. Meanwhile, the effects of the virus had changed. It was killing fewer pigs but survivors were weak and poorer producers of protein.

Government officials discussed many alternative plans for eradicating the disease, but cost-benefit studies strongly favored eliminating all the pigs as the least expensive eradication procedure with the highest probability of success.

So the government made a decision—unique in the history of the Western Hemisphere—to eliminate an entire domestic animal species and start fresh with new swine, free of ASF and many other diseases.

Thus, the eradication option chosen by the Dominican government meant not only that veterinarians would have to plan technical aspects of eradication in detail but that they would have to deal with social implications and internal economic disruptions as well.

In 1980 there was no domestic

pork for the traditional Christmas roast pig or the much loved "longaniza" sausage that has been a mainstay of the Dominican diet.

Local authorities, aided by financial support from the U.S. Agency for International Development, consultants from the Food and Agriculture Organization of the United Nations and technical support from the U.S. Department of Agriculture's Animal and Plant Health Inspection Service (APHIS), launched a pilot eradication program in the eastern part of the island in August 1979.

"By February of 1980 the entire swine population in the eastern part of the Dominican Republic had been destroyed," said Dr. Saul Wilson, APHIS' chief technical advisor to the Dominican Republic's ASF eradication program. "President Antonio Guzman extended the campaign to the entire country and all remaining swine were killed by September," Dr. Wilson said.

"Under the direction of Orlando Sanchez Diaz of the Secretariat of Agriculture, more than 90 'brigades' of veterinarians, soldiers, field workers and animal health person-



By September 1980, all domestic swine had been slaughtered in the Dominican Republic.



nel moved simultaneously from the east, north and Haitian border area in the west to complete the program," he said.

"We had to win the cooperation of the rural population, so the Dominican government launched a major public information effort to tell farmers they would receive a fair price for their hogs that were to be destroyed," Dr. Wilson said.

Farmers had the option of being paid money for their pigs or having them slaughtered on-the-spot for family consumption. "Meat from hogs that have ASF is not harmful to humans who eat it," Dr. Wilson said.

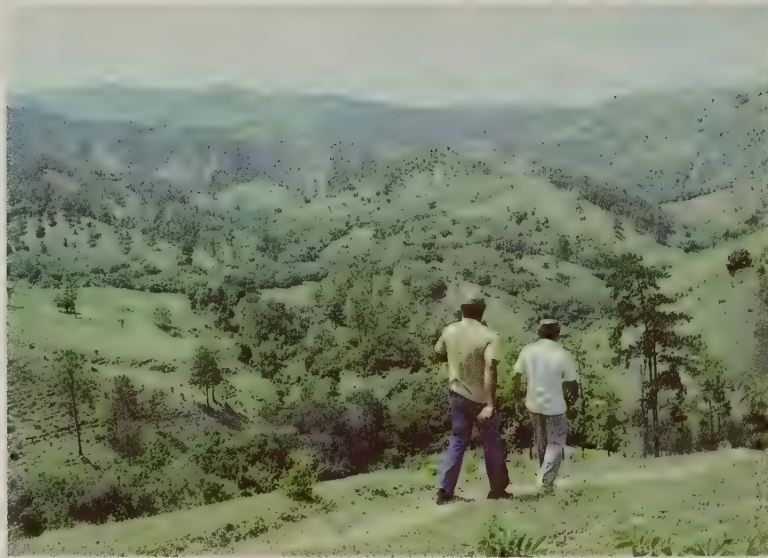
"The government distributed poultry to help feed rural families during the time before they could reintroduce disease-free swine," he said. "Extension veterinarians gave rural groups lectures and demonstrations to help them learn to manage poultry."

After pigs were killed, each area went through a 3-month pig-free waiting period to make sure the virus had been destroyed, Dr. Wilson said.

"Susceptible swine from the United States are being introduced as 'sentinels' to test whether the virus is still present," Dr. Wilson said. "If the sentinel pigs remain healthy for three months, the government will begin restocking with new pigs. So far, no pigs have shown any symptoms of African swine fever."

Countrywide, the process of no pigs, sentinel pigs and gradual restocking will take close to a year.

"But after this, the whole country will have a healthier swine population available, free not only from African swine fever, but also from other swine diseases," Dr. Wilson said. 🐷



The mountainous terrain and lack of roads in the Dominican Republic presented many problems for eradication planners.



Pork is a major source of animal protein at the dinner table in most Caribbean countries, but for Christmas 1980 there was no domestic pork for the Dominican people.



African swine fever killed nearly half of the 1.4 million hogs in the Dominican Republic.



## Technical Aspects of ASF Eradication

When the Dominican government decided to eradicate African swine fever (ASF) from the country, it faced an enormous technical and logistical task. Any eradication plan had to take into consideration the country's mountainous terrain, lack of roads and telephones and distribution of the swine population. It also had to consider the existing field structure of the Secretariat of Agriculture and the country's socio-economic realities.

Four nearly parallel mountain ranges cross the Dominican Republic, east to west. The large number of small farm families, and their pigs, tucked into these mountains meant that the eradication program would have to deploy large numbers

of small field teams to collect the animals.

Swine were grouped around the two major population centers: The capital city of Santo Domingo and Santiago, a large industrial city some 150 kilometers to the northwest.

The country is divided into seven agricultural regions, each with a regional director responsible to the Secretary of Agriculture; a permanent headquarters office; and a radio for communications with the capital and other regional offices.

And finally, the eradication plan had to keep in mind that the Dominican Republic was not a rich country and could not afford simply to bury all swine—and the potential protein

for human consumption that they represented—to eradicate the disease. A method of salvaging this protein, without the risk of putting ASF virus back in circulation, had to be included.

The final plan, drawn up by animal health specialists of the Dominican Secretariat in conjunction with technical advisors from the U.S. Department of Agriculture and the United Nations, called for systematic ASF eradication in two stages: First, in the eastern provinces and Samana Peninsula (the "pilot region"), which held approximately 10 percent of the swine population; and later, when the pilot program had been successfully completed, in the rest of the country.

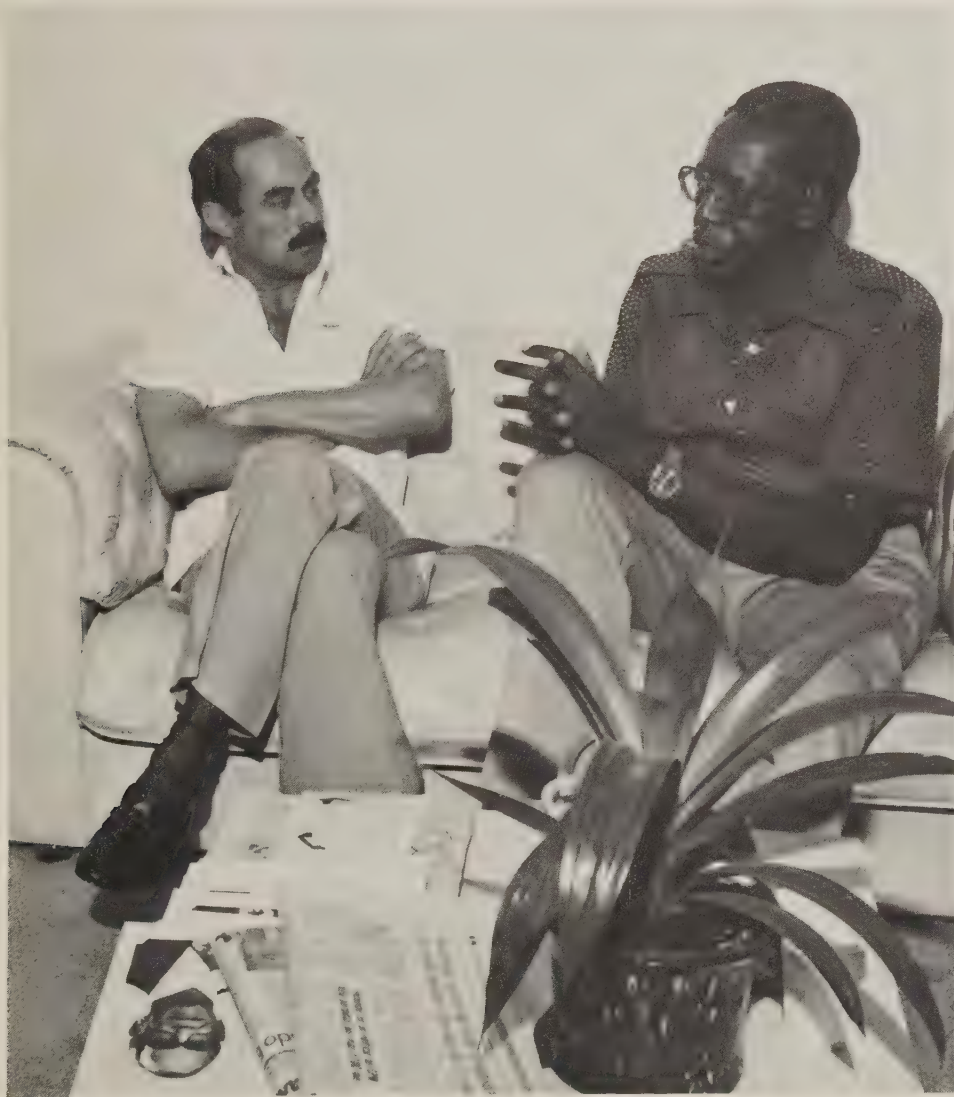
The East was chosen as the pilot region because it had a relatively small percentage of the country's swine and was an easy testing ground for program mechanisms and logistics. Samana Peninsula, although it extends to the west, was included because of the intense small craft water traffic with the northern boundary of the East. While the pilot program was being tested, disease control activities—eliminating infected and exposed herds where outbreaks occurred—would continue throughout the rest of the country.

In the early days of the ASF outbreak, the government had mobilized nearly all available resources in the country to fight the disease. Veterinarians, agronomists, and auxiliary personnel from the Secretariat of Agriculture led the brigades. Vehicles from all branches of government—cars, trucks, and even bulldozers—were pressed into service to slaughter and bury diseased and exposed herds.

But no functioning chains of command existed to channel all these resources and extraordinary individual and group efforts. In part, the original battle against ASF was likely lost because of the impossibility of carrying out such a massive emergency service through the existing structures.

Once the decision to eradicate had been made, the first step necessary was the establishment of a separate eradication program, apart from the regular livestock service and responsible directly to the Secretary of Agriculture.

So the Secretary of Agriculture formed a High Commission for ASF Eradication, consisting of Cabinet-level officials and authorities from



Eradication activities in the Dominican Republic were directed by Orlando Sanchez Diaz (left), executive secretary of the High Commission for ASF Eradication, who receives technical advice here from Dr. Saul Wilson, a veterinarian with USDA's Animal and Plant Health Inspection Service.



government agencies involved in the eradication effort. The President of the country was an *ex officio* member of the Commission.

Specific ASF eradication policies were defined and promulgated by the Commission.

The Executive Secretary of the Commission was charged with the responsibility of carrying out its policies. He worked with a staff organized into eight divisions: Appraisal and Compensation; Ports and Borders; Public Information and Education; Administration; Statistics; Laboratory; Technical Supervision; and Epidemiology. This last division monitored and assisted the work of the seven regional epidemiologists, one in each of the agricultural regions, who were locally responsible for carrying out the eradication program.

The eradication plan consisted of three phases, each requiring approximately three months.

In the first or "depopulation" phase, all swine were systematically removed from an area by eradication brigades, with the direction of the "sweep" determined by local geography. For example, in the first zone depopulated, at the eastern tip of the country, brigades worked their way inland from the seashore.

Swine were gathered in larger towns, slaughtered under veterinary inspection at municipal slaughterhouses, and the deboned meat sold to the local populace at half the

market price for fresh pork. Since lack of refrigeration in the countryside meant nearly all pork was consumed within 48 hours of slaughter, this procedure minimized the danger of reintroducing ASF into "cleared" areas.

During this second phase, control posts were set up along the edges of the region, to prevent re-entry of any swine or pork products, potential sources of ASF virus.

A sentinel phase came next, with small groups of imported ASF-free swine placed on selected farms to check for any remaining virus. An intensive monitoring system was set up to chart the daily progress of these sentinel swine. If the swine survived the 3-month sentinelization phase without clinical or serological evidence of disease, the area was considered free of ASF and ready for restocking.

Certain preparatory studies were also needed before field activities could begin. Surveys of ticks and wild swine were carried out in the pilot region some two months before the start of depopulation to determine if any living reservoirs of the ASF virus other than swine existed in the environment. The results of these surveys were negative, as were similar surveys carried out later in other parts of the country.

A country-wide blood sampling of all swine also began at the same time to identify those premises with infected swine. Survey results were

later used to select farms for placement of sentinel swine.

With all these preparations complete, field operations got underway in August 1979. Ten days later, the worst hurricane to strike the Dominican Republic in a century seriously disrupted all activities in the country and delayed completion of the pilot region phases.

But by March 1980, the pilot region was officially cleared of swine. Originally, it had been planned to wait for completion of repopulation in the East and then evaluate the pilot program before extending eradication efforts to the remainder of the country. But high government officials, including the President, were so encouraged by this progress that it was decided to move ahead immediately with the eradication program in the rest of the country.

A depopulation deadline of September 1980 was set and from that point on, the program operated on two timetables, with the eastern pilot region some six months ahead of the rest of the country. Sentinel swine were placed in the East in July 1980. The entire country was free of domestic swine by the end of August.

With all activities proceeding according to schedule, the Dominican Republic will begin repopulation with healthy swine, free of ASF and many other diseases, by mid-1981. 🐷



Dr. Pedro Lora (right), Dominican veterinarian in charge of the "sentinel pig" program, discusses the systematic removal of all swine from the country with a co-worker. Direction of the eradication "sweep" was determined by local geography.



## The Brigades— Key to Eradication

Field operations for the African swine fever (ASF) eradication program in the Dominican Republic were carried out by “brigades”—crews of 5 to 10 people who personified the program for the vast majority of the rural population. Each brigade was headed by a veterinarian or agricultural engineer. Other personnel include an appraiser from the government agricultural bank, veterinary assistants, soldiers and field workers.

In the eastern pilot region, where the program first started, brigade members were recruited from the local population. They were trained by and worked closely with veterinarians from Santo Domingo, the capital city.

When work was completed in the eastern region and the pilot program was declared a success, the program was immediately expanded to the rest of the country with a goal of eliminating all swine by September 1980. All but 10 of the 40 brigades that had worked in the pilot region were transferred to other parts of the country where they formed the nuclei of new brigades. Remaining team members were again recruited from the local community and from available military personnel.

The brigades had three main tasks. First they systematically collected apparently healthy swine from all premises. If the owner chose, some or all of his hogs could be slaughtered on the spot and used for family consumption. But he could also choose to let the brigades buy his swine and ship them to a central slaughter spot.

Second, the brigades returned to premises where ASF-infected hogs had been destroyed and thoroughly cleaned and disinfected the premises. This involved scrubbing down all permanent installations and buildings with disinfectant; scrubbing or burning wooden, straw or bamboo materials used in the swine pens; and disinfecting the area where hogs had been kept.

And third, once the area was cleared of swine and disinfected, a reduced number of brigades were detailed to remain in the swine-free area to find and confiscate any illegal hogs or pork products. They were assisted by control post per-



When swine were collected, the owner had an option to be paid for them . . . or to have them slaughtered by brigade members on the spot for immediate consumption.



Swine collected from farms were brought to a central point and then shipped to Santo Domingo by INESPRE, the Dominican government price control agency that provides food staples to lower-income families.





The brigades—crews of five to ten people each—moved through the mountains and jungles of the Dominican Republic searching for pigs.

sonnel, who set up inspection points at strategic crossroads and along highways. Control posts were manned by military and auxiliary veterinary personnel.

The discipline and dedication of military and civilian brigade personnel—including their ability to resolve on-the-spot problems that arose and their capacity to with-

stand long hours of strenuous physical labor in rough terrain—were a decisive element in the Dominican Republic's ASF eradication program. 🐷

## Swine “Depopulation” Procedures

When the Dominican Republic first started fighting African swine fever in July 1978, all infected and exposed swine herds found were simply slaughtered and buried.

But once systematic country-wide elimination of the entire swine population began, new procedures had to be developed to take into account the need to salvage as much protein as possible for the people.

When a zone was identified for “depopulation,” radio announcements advised people in the area

when brigades would begin work. Owners were encouraged to sell swine through regular market channels before that date (as long as market prices were higher than the fixed compensation price paid).

Owners who still had hogs when the brigades began operations had two choices. They could keep some or all of the animals for immediate slaughter and home consumption. Or they could “sell” the hogs to the brigades at a fixed rate per kilo.

The brigades collected swine from

several farms. The hogs were then shipped to Santo Domingo by INESPRES, the government price control agency that runs a program to provide food staples at reduced prices to lower income rural and urban families. After the swine were slaughtered under government meat inspection, INESPRES sold the fresh pork throughout the country in its stores and through its street vendors. 🐷





## Stopping the “Pig Runners”

As the systematic elimination of the Dominican Republic's swine got underway, control posts were set up along major roadways to keep live hogs and pork products out of swine-free areas. Military and auxiliary veterinary personnel assigned to each control post faced a difficult task, for “pig runners” could realize profits by smuggling. Any swine or pork products were confiscated and the owner was given no compensation. Here inspectors find a pig hidden in a box under some lettuce.







## **What Do They Eat When All the Pork Is Gone?**

Pork has always been an important and traditional source of animal protein for the Dominican people—in the form of longaniza, chorizo, salchichon, chicharrones and the traditional roast pig at Christmas time. When it was decided to eliminate the country's entire swine population, eradication program officials decided to increase the availability of laying hens during the "no-pig" period—both as a source of protein and for ready cash for poorer families in the countryside.







Chickens were bred and raised at a facility near Santo Domingo. From there, the chickens were transported to regional agricultural offices, where extension veterinarians distributed them at a minimal cost to local groups—housewives' associations, youth clubs and rural farmer or "campesino" cooperatives. New poultry owners were given lectures and demonstrations on poultry management to teach them how to care for the chickens.

## Compensation— The Bottom Line

Timely and fair compensation paid to owners for animals destroyed is fundamental to the success of any animal disease eradication program.

In the early days of the ASF outbreak in the Dominican Republic, owners of infected and exposed herds that were destroyed were issued promissory notes in lieu of cash. Although it took only six weeks for passage of authorizing legislation to create a compensation fund (an increase in import duties produced a \$20 million indemnity fund), it took nearly a year to develop a recording and payment system that allowed owners to

receive prompt cash payments. This early delay in payments resulted in farmer mistrust of the eradication program.

The new compensation system allowed the swine owner to receive compensation checks within two to five days after his animals were slaughtered or removed for slaughter. The owner also had the option of keeping the slaughtered carcasses of apparently healthy hogs for immediate home consumption.

Originally the compensation rate was determined by a complicated formula that included age, breed and size of the animal. The new system used a fixed rate of one

Dominican peso (about one U.S. dollar) per kilo (2.2 pounds) of live-weight—about 46 cents per pound. The animal's weight was mutually agreed upon at the farm by the owner and the official program appraiser accompanying the brigades.

The entire compensation mechanism was handled through the Agricultural Bank, a national finance institution that has branch offices in all provincial capitals of the country.

Developing this rapid and consistent procedure for compensating farmers helped overcome their initial resistance to the eradication program. 🐷



## Public Information . . . “The Rumors Can Kill You”

“They’re going to come and kill all the black cows after they’ve killed all the pigs. What’s worse, the brigades are going to come back a third time to kill us!”

Ridiculous? Surely. But these are the kinds of rumors that spread during African swine fever eradication activities in the Dominican Republic.

Rumors—they’re dangerous things born out of ignorance. Nevertheless, they can have devastating effects and really hamper the progress of any good disease eradication or control program.

A well-informed public is a major asset for an effective program. So honest and complete public information and education are imperative.

The Dominican Republic found this out early in its fight against African swine fever. Before an ASF eradication program and staff were set up, anyone with access to a reporter became an “expert” on the subject. And so conflicting reports,

announcements, accusations and rumors resulted in a great deal of public mistrust—and a very low credibility level for ASF program officials.

The first problem was a widespread fear among urban consumers, according to Patricia Chain, a communications specialist with the Food and Agriculture Organization (FAO) of the United Nations.

“Urban consumers believed that they would catch ASF by eating pork,” Chain said. “Despite repeated government statements that the disease did not affect humans, and that only inspected pork was being sold in the cities, fresh pork sales dropped dramatically.”

Chain, who served as a consultant for the Dominican Republic’s ASF eradication program information activities, said, “Finally, in September 1978, the Secretariat of Agriculture staged a major campaign that restored public confidence. A public

luncheon was held in Santo Domingo and only pork dishes were served. Heavy news coverage was given to the event, showing President Antonio Guzman and the Secretaries of Agriculture and Public Health eating the pork dishes. Two week-long moratoriums on beef sales also helped direct meat purchasers back to pork.”

By May 1979, written guidelines on information were established. The primary public information objective was to reach the people within any zone or region where swine would be destroyed so that swine owners would be aware of the disease and the need for the program and would understand the different phases of the program. Swine owners were urged to aid the brigades rather than resisting and delaying eradication. It was pointed out that cooperation would speed restocking of the country’s swine population.

People were reached through local meetings, radio, newspapers and flyers. The objective was to inform people that swine were diseased—although the disease would not hurt people—and that new, healthy swine would be available in the future.

People were also assured that they would be compensated for all swine that were taken by the brigades. They were also encouraged to sell their swine first through regular market channels if they could get a higher price than the compensation rate. Throughout all information activities, the need for local community support was stressed. 🐷



Program personnel found that a good public information campaign was critical to smooth functioning of the eradication effort.





## **“Sentinel” Pigs and Restocking . . . Pigs in Paradise**

Midwestern pigs in a tropical setting—that’s the scenario for making sure African swine fever has been eradicated from the Dominican Republic.

According to Dr. Benedicto Negron, epidemiologist with the U.S. Department of Agriculture’s Animal and Plant Health Inspection Service (APHIS), “Once all the native hogs are eliminated from an area, there is a three-month ‘pig-free’ period—to make sure all pigs and pork products that might harbor the ASF virus are gone. Then healthy, susceptible pigs are imported from the United States to be placed on previously infected farms and observed for three months.

“If these sentinel pigs remain free of African swine fever—and other swine diseases such as hog cholera, brucellosis and pseudorabies,” said Dr. Negron, “eradication is con-

sidered complete and the region will be restocked with additional healthy pigs.”

In choosing sentinels, eradication program officials looked for healthy pigs, free of most swine diseases. By doing so, they could eliminate other swine diseases—such as hog cholera—which were widespread before the ASF outbreak.

The first group of sentinels consisted of 236 healthy 30- to 50-pound pigs that were assembled and held in quarantine for ten days in early June 1980 at the Iowa State Fairgrounds in Des Moines. All of the pigs were Specific Pathogen Free (SPF) animals—that is, free of a number of specific diseases. In addition, they had to meet several other Dominican health requirements.

The first and subsequent shipments consisted of a ratio of 12 gilts to 1 boar. The gilts are York-

shires or crossbreds with predominately Yorkshire breeding, while the boars are purebred Yorkshires or Durocs.

The first shipment left Des Moines in a sealed truck for an overland trip to an APHIS export facility at Miami, Fla. They had one supervised stop in Chatanooga, Tenn., for feed and water. Following a rest and a final check by APHIS veterinarians in Miami, the pigs were transferred to a 727 jet for a flight to La Romana, a city in the eastern part of the Dominican Republic in an area that had been cleared of swine early.

After arriving at La Romana, the pigs were held in quarantine at El Seibo for another 30 days for further tests and to become acclimated to the higher temperatures of the tropics and changes in feed. Then they were taken in groups of three





The first shipment of "sentinel" pigs were flown into La Romana in the eastern part of the Dominican Republic.



U.S. consultants worked with Dominican veterinarians in monitoring the health of Yorkshire and Duroc pigs from the midwest—free of most swine diseases. Held in quarantine at El Seibo for 30 days, the pigs received further tests while they became acclimated to the higher temperatures of the tropics and changes in feed.



The sentinel pigs adapted very well to the tropical climate and local food. Dominican veterinarians made daily rounds to check the health of the pigs.



to eight and placed on farms in the countryside for observation.

Ed ThomaE, an APHIS animal health technician who has helped identify locations for and needs of the sentinel swine, said that three types of premises were chosen: (1) Locations where laboratory confirmations of ASF had been obtained during the outbreak; (2) premises where ASF had been suspected but never confirmed; and (3) spots that had been tested ASF-free throughout the outbreak period. "The observation farms range in size from small backyard operations to large commercial enterprises," said ThomaE.

During the three-month observation period, blood samples were tested every 45 days.

Dr. Walter R. Eskew, foreign animal disease diagnostician with APHIS, said that the first group of sentinels, tested in September 1980, showed no signs of ASF or other exotic diseases. "The sentinel pigs adapted very well to the tropical climate and local food," Dr. Eskew said. "If all tests prove negative, restocking will begin nationwide."

Details of the restocking program have not yet been finalized. However, Dr. Pedro Lora, veterinarian in charge of the sentinelization phase for the Dominican Republic, said this program likely will involve loaning out lots of pigs with the stipulation that they are kept in centralized locations by rural cooperatives or

groups of "campesinos". There, the pigs—in groups of about 20 gilts and 2 or 3 boars—will be bred, fed and cared for by all members of the group. The loan, handled through the Agricultural Bank, would be repaid either in cash or in pigs.

Commercial producers will likely make separate arrangements to import large lots of swine for restocking their operations. However, these imports will be subject to the same restrictions placed on the sentinel pigs—that is, they must be free of African swine fever and several other diseases, including hog cholera, brucellosis and pseudorabies.

By keeping out a variety of swine diseases, the Dominican Republic can enjoy a new, healthier swine population once restocking is complete. This will not only make swine production more profitable, but will open up the possibility of exporting climatized, disease-free pigs to other nations. 🐷



## In Search of the Last Oink

by Mary T. Sebrechts\*

It's a good thing I'd packed jeans and hiking boots when I left Washington, D.C. For there I was, a "gringa" in the midst of a hard-working force of veterinarians, military and support personnel, hiking through the mountains of the Dominican Republic searching for pigs.

These animal disease control brigades—some 90 groups of five to ten men each—were working throughout the Dominican Republic to find and slaughter every single pig in the country.

I'm a photojournalist. I'd been assigned the task of recording the activities of these brigades on film

as they marched long and hard hours, up and down the mountains on foot . . . searching, searching . . . for one sight of a hidden pig . . . one small "oink" in the underbrush.

It sounds like something out of a war movie—men on a "search and destroy" mission. And in many ways it is a war . . . a war against an economically devastating swine disease that has invaded the Western Hemisphere. Today, the Dominican Republic is the main battleground in the fight against African swine fever (ASF).

In 1979, the Dominican government made a unique decision—to

slaughter its entire swine population to free itself from this costly foreign animal disease.

There is strong evidence that ASF virus entered the Dominican Republic in 1978 through infected pork scraps in garbage from an international airline flight. The garbage was fed to swine, and pigs were sold from this herd before anyone realized they were infected with the highly contagious viral disease. Soon pigs began dying throughout the entire countryside.

After setting up an emergency system to combat the disease, the country began carrying on an all-out





Brigade members argue over payment with a woman who had hidden a sow and her pigs.



"Piggy-back" was often the only way to bring the pigs out of the mountains to trucks where they could be hauled to central collecting points.



battle to eliminate it. The brigades were the front line troops.

The initial days of finding and slaughtering pigs were grueling, but straightforward. The brigades could always be sure there were pigs to be found. But when they began their followup searches, it was a different story. Some rural families or “campesinos” afraid of losing their pigs—their “piggy bank” or pet—would hide their hogs.

I was told of one brigade that entered a campesino’s yard and spoke to family members over the blasting noises of a radio playing inside the house. The family flatly denied any knowledge or sighting of pigs, when suddenly through the blaring songs came an unmistakable “oink.” In the house they found a large sow—tied up and lying under the bedsheets!

The surveillance brigades also received leads from campesinos whose pigs had already been taken. These people knew that the longer pigs were hidden, the longer it would be until everyone could have new pigs. Hiding pigs would only cause delays in declaring the area free of disease.

My typical day with the brigades began at dawn—time for a quick shower and cup of coffee and off to meet by 6 a.m. We piled into the back of a pickup or flatbed truck and started the long drive out to an area where pigs had been reported.

We drove as far as possible on the twisting, winding mountain trails—not an easy task, no matter how good your truck. On my first day out, our truck lost traction on the loose rocks and began slipping down a treacherous slope. The emergency brake failed. After teetering perilously on the hillcrest, it was only by the grace of “the powers that be” and a perfectly placed fence—which the truck destroyed—that we avoided going over the edge. The brigade, used to these problems, quickly got the truck onto the road . . . and on and up we went.

After three miles, we had gone as far as possible by truck, so we continued on foot. We hiked for hours at a quick march. The brigade split in four different directions, going through the underbrush, fields and wooded areas. Some of the men joked about my ability to keep up. One soldier told me he’d trained for eight years in the military to learn to climb those steep mountainsides. Among themselves the brigade referred to me as “la tigrona,” which loosely translates to “the tigress,”

although I never let on that I knew about this nickname.

After 2 hours of going up and down mountainsides, the four groups converged in a central valley. No one had found any pigs. After a brief snack on some small, hard, bitter fruit from a nearby tree, we headed back to the trucks empty handed.

Another hour’s drive and we jumped out and split up again. Hiking, hiking . . . with miles between thatched, palm-bark houses. My group stopped to question anyone it could find—a farmer in his fields, a little boy trudging back up the mountain to his home—asking again and again, “Have you seen any pigs?”

“No, they came and took them away.”

“But are there others still here in these hills?”

“No.”

Then someone spotted a small enclosure maybe three feet high in one of the valleys, far away from any homes. Too small to keep a large hog in . . . but there were baby pigs down under the palm leaves! That meant someone, somewhere, was holding a sow.

But after each 15- to 30-minute hike to find another person we got the same story—no pigs and no one owned that property in the valley. Finally another stop at a home, to ask the same questions of a teenage girl sitting on the patio.

“No, no pigs.”

“Are your parents here?”

“No, they’re off in the hills.”

As we started to leave, we passed a large area of underbrush. One brigade member’s quick eye detected movement in the underbrush—a large sow tied to a tree! Back to the same house. This time we found an older brother in his late twenties.

“Have you seen any pigs nearby?”

“None.”

Then the mother appeared.

“Who does that property belong to?”

“It’s ours.”

“And you have no pigs?”

“None.”

“Well then, we can just take that sow tied to the tree.”

Sudden panic . . . and the truth came out. They did have a pig, but just one. And they really needed it. It was all they had and she was a family pet. Pleading, pleading with the brigade . . . but to no avail. It was hard to take her, but it had to be done.

With the help of the young man

we untied the sow and took her to the valley to her babies. Two brigade members remained with the pigs while the third went to fetch those brigade members who had gone searching in other directions.

During the next hour while we waited for help to carry all the pigs out of the valley, people began coming from miles around. The deserted hillside was transformed into a three-ring circus.

When the appraiser arrived, the group decided to offer this family the option of compensation or of slaughtering pigs for personal consumption even though they had hidden their pigs. Because they had no refrigeration, this family chose to be paid.

We were a strange group that marched out of the valley, up and down the hillsides, pulling the stubborn sow along and carrying her babies on our backs. We loaded the pigs onto the truck and went to join the remaining half of the brigade, which was about 15 miles away with some other hidden pigs.

We arrived to find the road blocked with people. The brigade leader was angry. His men had made about five trips trying to find these pigs. The woman who owned them had always denied knowledge of them, though she took the pigs from the central road where she lived and hid them way up in the hills.

The woman yelled and screamed, asked for the meat to eat or for money for the pigs. She was rude and hysterical, knowing the brigades would not pay for hidden pigs. The neighbors jumped in to quiet her down. They were angry with her for hiding the pigs and thus delaying their possible date for restocking with healthy pigs. But they also knew this woman couldn’t afford the loss of her pigs. They were all poor rural families. So the neighbors also spoke in her behalf, apologizing to the brigades for all the trouble and yelling at her to stop being rude.

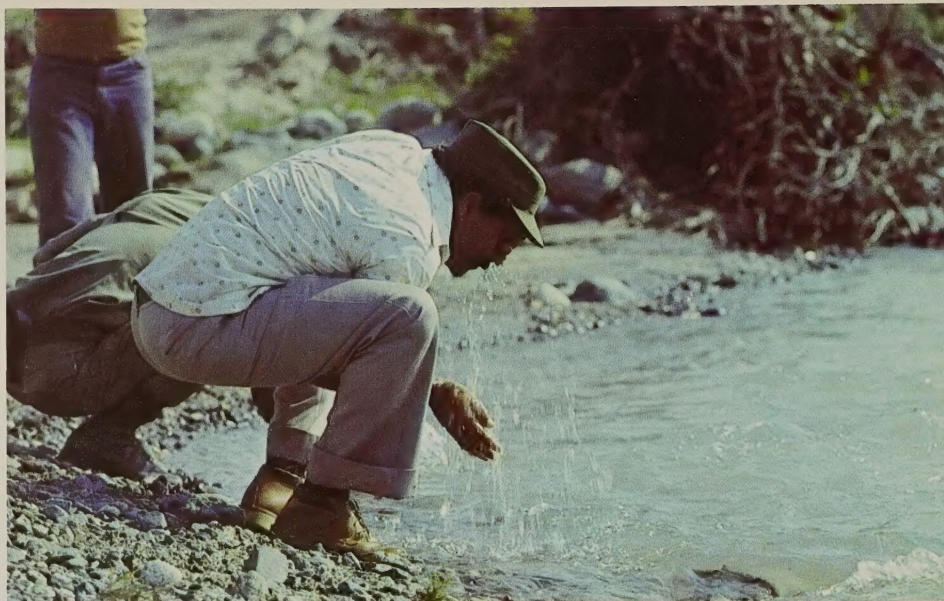
In the end, the brigade slaughtered the largest pig and left the carcass for the family’s next meal.

Finally, hot and sweaty, we drove with the pigs to the central collection point. There the hogs could be slaughtered and their meat properly handled for redistribution to lower income rural and urban families at reduced prices.

The last stop of our day, as the sun slowly sank, was to the river. There a young boy stooped over an open fire, stirring our dinner—a



stew in a large iron pot. The men dashed down to the river to wash off the day's dust, get a drink of water and relax. Then they slowly headed over to the outdoor "kitchen" to fill their empty stomachs and unwind from a hectic day. 🐷



The men enjoy a refreshing splash of water after a hard day spent hiking through the mountains looking for pigs.

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*The brigades are winning the war against African swine fever. by September 1980, every hog in the Dominican Republic had been killed; soon the country will be restocking with healthy pigs.*

*I miss the brigades now, the long tiring days of wonderful comraderie and purpose which kept everyone going at an incredible pace. I admire these men for their ability to continue on day after day, month after month, with smiles on their faces, a joke on their tongues and their special ability to deal nicely and sensitively with each campesino, taking the time to explain the situation, talking with them, laughing with them. And I am very happy and proud for them as they near an end to their work.*

*I hope that we in the United States can gain some insight from the difficult saga of the ASF outbreak in the Dominican Republic. So far we've been lucky in the United States—we've managed to contain exotic animal diseases before they spread country-wide as ASF did in the Dominican Republic. But even our local or state-wide efforts have been costly. An outbreak of exotic Newcastle in the California poultry industry cost \$56 million to eradicate. The losses could be much higher if a foreign animal disease*

*managed to gain a country-wide foothold.*

*Even people far removed from pigs, poultry or cattle could unwittingly be the cause of this kind of devastation by bringing infected animal or plant products into the United States. Travelers can help prevent the introduction of foreign animal diseases and plant pests, by passing up souvenirs of sausage (longaniza, salchicharon, chicharrone and other pork products) or any other restricted meat and plant products. They can prepare by reading a copy of "Travelers' Tips," available free from the U.S. Department of Agriculture, Washington, D.C. 20250.*

*And if we honestly answer the declaration form questions when we return from a foreign trip, we can help our border inspectors in their job of keeping out items which could threaten our livestock and crops, and in turn our supermarket stocks and prices.*

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